HNOLOGY DEPT.

The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. L
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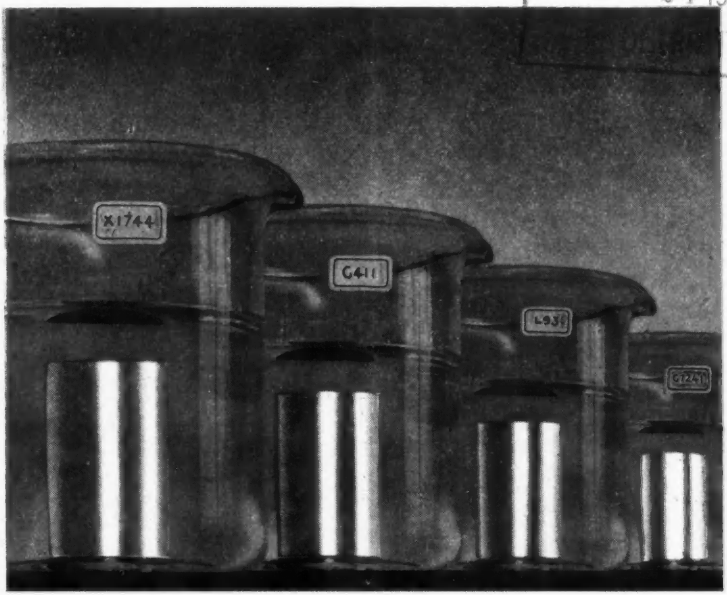

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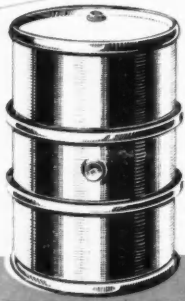

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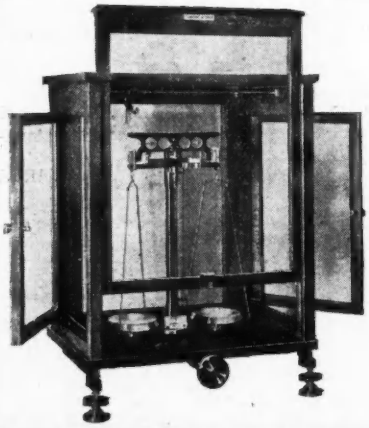

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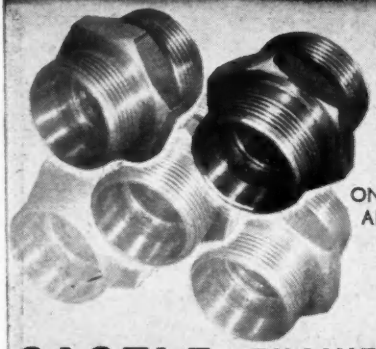

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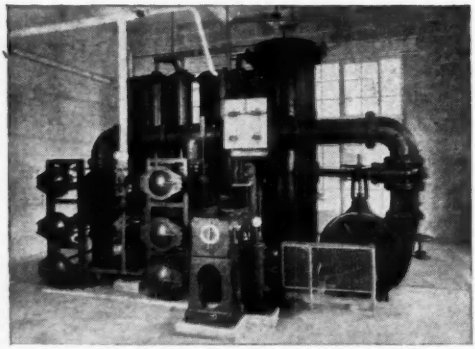

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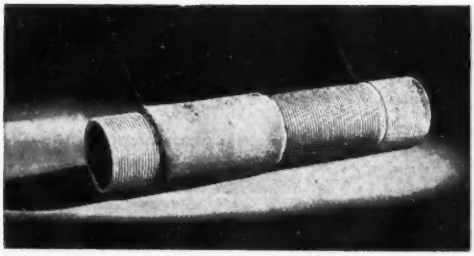

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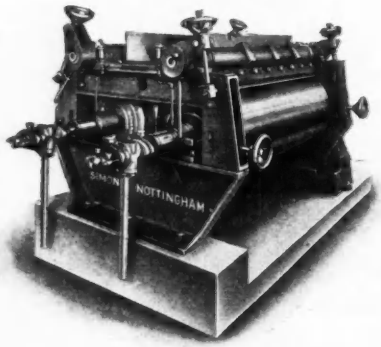

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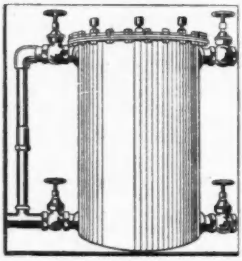

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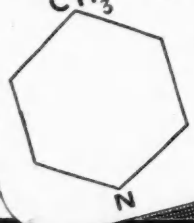

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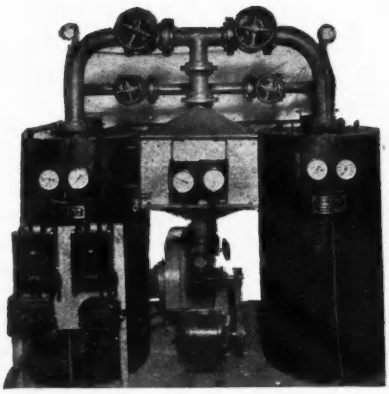

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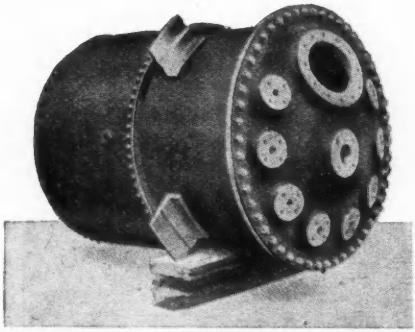

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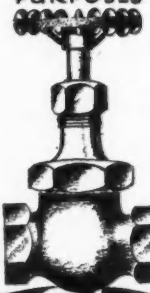

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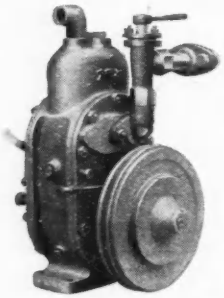

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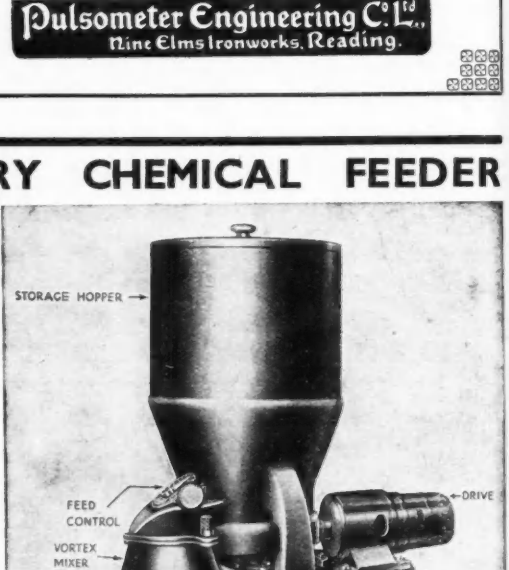

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January 29, 1944

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U.N.R.R.A. and After

THE United Nations Relief and Rehabilitation Administration has been set up to deal with the most tragic situation that has arisen in this world within historical times. Great world catastrophes such as the Black Death may have caused a wastage of men's lives in the civilised world equalling in proportion the toll of this war, but at least those scourges left the survivors with their houses, their workshops, their farms, and, for the most part, their health. Famine followed some plagues because the soil had not been tilled, but we should doubt whether any visitation in the darkest ages ever approached, in the sum of human misery, the ravages of the Germans and their allies. An estimate, described as "conservative," puts at 500,000,000 the number of persons who will be in need of help when this war ends. Without reckoning the needs of Russia—which are large, but which may be partly supplied before the fighting ends—or of hostile or neutral countries, it has been estimated that the liberated peoples will require some 50,000,000 tons of foodstuffs, raw materials, and other articles of prime necessity in the first six months of peace. The overrun peoples will not only need food, they will also need the power to work, new factories, the reconditioning of their mines, dwellings, public utilities, and land (including both stock and fertilisers) and, last but not least, their health. A writer has said: "Before the winter passes and the spring dawns again how far—and with what consequences—deterioration will have gone none can compute. More than enough is known already to make it certain that merely to restore the physical and mental health of Europe will call for measures boldly organised, and energetically applied."

The broad principle has been adopted of financing this new body by means of a 1 per cent. levy on the national incomes of contributing countries, and proposals are under discussion for the control of supplies and prices and for the return and resettlement of the displaced populations. It must not be forgotten that peace will find the world in need of just those articles that are now in short demand. As factories can be spared from war production they will doubtless be put to work to manufacture goods that will be needed by U.N.R.R.A., and we understand that this has been done already to some extent in this country and in

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America. Obviously, this factor will have an important bearing on the retention of controls after the war. If certain goods are needed to save life and restore health in the countries of our less fortunate allies, they cannot be allowed to be bought by those who need them only as luxuries. We must ration ourselves that others may live.

While this organisation is intended to be a provisional and temporary means of rehabilitating downtrodden Europe, and will be both necessary and desirable for the regulation of distribution, it must not be forgotten that such organisations have a habit of becoming permanent, once the Civil Service gets control of them. U.N.R.R.A. must work in close collaboration with every sort of manufacturing business in the Allied industrial communities that have not been over-run; but close collaboration is liable to involve compulsion, *i.e.*, "controls," as we have pointed out. To U.N.R.R.A. can be left the task of distributing what is immediately necessary and of deciding what is required and where. To industry should be left the task of arranging for the manufacture of the necessary goods. Some manufacturing capacity must be left to provide for our home needs. We do not desire luxuries—those can wait—but we must see that our own reconstruction of industrial plant proceeds at least at an equal rate with that of the other United Nations, and at a greater rate than that of the nations which are now our enemies. We cannot afford to be handicapped in the industrial race and to let others get our natural markets because they happen to procure more up-to-date plant a year or two earlier than we do.

This is not a selfish view; it is just common sense and common fairness. What is needed, of course, is some means of regulating international trade. The danger, to our mind, is that since U.N.R.R.A. will start by regulating the flow of goods into Europe, and possibly into other nations as well, it may end by attempting to regulate the flow of goods throughout the world. U.N.R.R.A. is staffed by Civil Servants and there is a very real danger that the bureaucracy may try to take the bit between its teeth and run away with industry. The tail must not wag the dog, and, if U.N.R.R.A. is to be perpetuated, it should be staffed by industrialists as soon as its immediate task is done. There is a hint—to our minds a sinister hint—in a leading article in a principal "organ of public opinion," to this effect. "Essentially a functional organisation, U.N.R.R.A. may develop into something broader and more enduring. . . . Where relief and rehabilitation, as such, and where long-term recovery and reconstruction begin cannot be accurately defined."

Proposals made by Sir Edgar Jones are worth consideration in connection with the regulation of export trade and the work of long-term recovery and reconstruction. He has proposed that an expert commission should review every country in the world in collaboration with the industries and Governments of the countries concerned. Presumably those countries that are already heavily industrialised would be omitted from the survey. The objective would be to make every country as nearly industrialised as possible. While the industrial countries of Europe can measure their imports in terms of £30 or so per head, others, such as China, measure imports by a few shillings a head.

It has been repeatedly pointed out in these columns that one way to industrial prosperity and full employment is to promote the advancement of the backward nations. The expert commission would thus set up for each country what projects it should undertake in view of its raw materials and of the needs of its people. These should then be proceeded with in rotation, being for that purpose graded into categories in order of urgency. In that way our heavy capital industries and those of the U.S.A., Canada, and other countries would be provided with work for 50 or 100 years to come. At the end of that time the world would have so far advanced that there should be almost unlimited possibilities of export trade between the populations of the earth, all able to buy goods that to-day they have perhaps never heard of. It is an attractive picture, and the movement appears to have made a good deal of headway both in this country and America. It would seem that some such survey will need to be made by U.N.R.R.A. in the immediate future for certain countries. It would be much better if a properly accredited body of industrialists made the more comprehensive survey.

NOTES AND COMMENTS

Industrial Health Services

THE gulf that exists between what is known about industrial health and the amount of such knowledge that is effectively applied is enormous. Any attempt to offer constructive suggestions that might help to reduce the gap is worthy of attention, and the Association of Scientific Workers is to be congratulated on putting forward a number of useful ideas on this subject in the form of a memorandum on industrial medical services. The primary problem is to devise a scheme whereby the *smaller* factories can enjoy health facilities similar to those that exist, for instance, in Royal Ordnance Factories. Most of the doctors who work in industrial establishments, either whole-time or part-time, are in factories employing 500 or more persons, whereas about 70 per cent. of the workers —corresponding to 99 per cent. of the factories—are members of units of 500 or less. The result is that only 20-25 per cent. of the industrial population is covered by existing industrial medical services. The small firm's difficulty in this connection is largely financial, and to meet that difficulty the Association advocates the formation of an industrial health service, the doctor-members of which would be appointed, paid, and controlled by a wider authority than the individual firms in which they would work.

Factory Health Committees

SUCH a service, if it were to succeed in its objects, would need to be closely linked with the family-doctor service, and good relations between the "industrial" doctors and the workers would also be essential. Recently, the Chief Inspector of Factories suggested that factory health committees should be formed to consider matters of health as well as of safety. Such committees would be useful in educating the workers to make the best use of the industrial medical services. The A.Sc.W. expresses the view that this suggestion could best be implemented if existing works councils, joint production committees, etc., were to form sub-committees, the concern of which would be to encourage an active interest in the health and safety regulations of the Factories Act, in canteen diets, in rehabilitation measures, and similar matters. These sub-committees, adds the memorandum, might include trade-union representatives, medical and welfare personnel, chemists and other scientific workers, safety engineers, and representatives of the management. We hope that this memorandum will achieve a wide circulation among both employers and trade unionists, and receive the close consideration that it deserves.

RDX Chemists

OFFICIAL secrecy about the explosive RDX has been very stringent, though recently the Ministry of Supply did release the names of the experts who had been killed while engaged in work connected with the perfecting of the large-scale process of manufacturing it. They included Commander P. A. M. Long, Mr. F. C. Lewis, Mr. S. Cooper, Mr. W. E. Johnston, and Mr. J. Brignall. Important contributions to this field have also been made by chemists of Canada and the United States. According to an official British statement, their efforts have enabled the explosive to be made in North America more simply and more cheaply than anywhere else. *Canadian Chemistry and Process Industries*, in a recent issue, names some of the Canadians who were involved in the researches that led to improved manufacturing processes. A team headed by Dr. J. H. Ross of McGill University, and including Dr. R. W. Schiessler, Dr. R. Boyer, and Dr. H. S. Sutherland, evolved, early in the war, a reaction that offered promise for an industrial process. The technique was novel and, indeed, for a time, there was some doubt as to the character of the final explosive, so that a sample of the new RDX had to be sent to England for comparison with material of more "orthodox" origin. Particulars of the process were disclosed also to the United States authorities, which resulted in an improvement at the suggestion of Dr. Bachman of Michigan University. Dr. G. F. Wright of Toronto University, was able to improve still further the method of manufacture. The Canadian Minister of Munitions paid a recent tribute to the five Canadian chemists in

these words: "Their discoveries have increased substantially the striking power of the United Nations. Canada is grateful to them." It is time that some similar tribute was paid to the British chemists who have carried out RDX research, and a few more names released.

China Clay Prepares

IT is evident that the china-clay industry will have to remain in its present stricken condition until the war is over. A preternaturally low output has been enforced, first by the transfer of china-clay workers to other work of a more urgent nature, and secondly, by the restriction of the markets, which is described by the Board of Trade as "concentration"—that is, a few china-clay works are kept going, while the remainder are closed except for maintenance purposes. There are, however, indications that the producers are getting ready for a revival of trade as soon as labour is available, but not before victory has been secured. It is believed in well-informed circles that the industry can then be relied upon to put itself rapidly into such a condition that it will be able to meet any demands that may be made upon it.

Gas Grids

PURSUING the policy of integration, foreshadowed in the report of the Post-War Planning Committee of the British Gas Federation not long ago, the information organisation of Gas Industry House has issued a manifesto outlining the advantages, to all industries, of a linked system of gas supply, which, in its completest form, becomes a gas grid, though modified plans of a similar nature have also been found useful. Over 800 trades and industries, it is stated, have been listed as users of industrial gas, and, in order to meet the resultant demands, the gas industry is planning a wholesale concentration of gas production, and the further construction of regional grids to convey fuel in the most efficient way, even to outlying districts at present without gas. Several grids are already in operation, and, of those to be constructed, some will resemble the Sheffield area, where over 70 per cent. of the gas made is supplied to industry, and all the substantial coke-oven plants are linked up. It is pointed out that here, despite the heavy capital cost of constructing the grid, the price of gas has been kept almost level by means of the economies effected, such as the closing down of the less efficient carbonising plants. Furthermore, the grid can, it is claimed, satisfy the demands of new industries developed anywhere in its supply area. Another type of integration is operating in the Stretford area, where the mains of the local Gas Board are linked up, at several points, with those of neighbouring undertakings. This facilitates the interchange of gas in an emergency, and it is noted that the linked mains have already operated successfully.

Dearer Coal

THE prices of coal and coke are to be raised by three shillings a ton on February 1, according to a written reply made by the Minister of Fuel and Power to a parliamentary question. A variety of reasons have been adduced to account for the necessity of the rise. The coal charges account, it is stated, has been running at a loss for some time, and the time has come to repay the loans made by the Treasury to the account. It is also necessary to provide for the financial effects of the recent legislation on workmen's compensation, and to secure to the owners the credit balances promised by the Government. It is expected, in addition, that costs of production will increase further during 1944, mainly owing to the decline in productivity per unit of labour, this last being accounted for by the wastage of experienced miners, the increasing age of those who remain, and the influx of new entrants into the coal-mining industry. When considering the effect that this rise in coal prices is likely to have on the cost of chemical commodities it is interesting to remember that the last increase in the price of coal was made in December, 1942. During 1942, the percentage rise in coal cost was 10.6, while that of chemicals was 9.6; during 1943, the corresponding figures were 3.1 and 6.0. In the earlier part of the war a similar linkage was observable, and figures are worth recording: August-December, 1939, coal 8.6 per cent. rise, chemicals 13.4; 1940, coal 19.5, chemicals 16.2; 1941, coal 6.9, chemicals 5.8.

American Developments

Recent Progress in Industrial Chemistry

by MAXIMILIAN TOCH,* D.Sc., F.C.S., and LAWRENCE H. SINGER

THE story of numerous interesting and important developments in American war-time chemistry will, of course, have to await the dawn of peace. All that can be reported at this time is a tantalising series of superficial observations.

A few months ago, Dr. C. T. Compton, president of the Massachusetts Institute of Technology, was bold enough to predict some of the wonders which will be unfolded in the post-war world. Among his forecasts were automobiles made of aluminium and magnesium; and the development of hundreds of light metals, unknown outside the laboratory ten years ago. "They should lift men as far above the Steel Age," commented Dr. Compton, "as the Steel Age lifted us above the Bronze—if not farther."

Only a rash person would undertake to itemise the changes that lie ahead, but no man can doubt that startling innovations will confront us. We cannot be as pessimistic as the gentleman described not long ago by Mr. C. F. Kettering, research director of General Motors Corporation. He told of the official in the U.S. Patent Office who resigned his position some 70 years ago, because he had come to the conclusion that every possible new improvement had been invented.

Inventions Required

Dr. C. G. Fink, professor of chemistry at Columbia University, recently drew up a list of the principal inventions for which industry is waiting. He included the following five materials: an electric light ten times as efficient as any we now have; an automobile engine three or four times as efficient as present types; an alloy of aluminium as resistant to fatigue as steel; a metal or other material to take the place of our rapidly dwindling resources of copper and lead; and a material as good as leather for shoes. Chemists may well ponder that list. The scientists who find the keys to these demands will have earned the undying gratitude of their fellow men.

Let us take a swift glance at some current technological developments. The field in which the most striking progress has been made in the United States is probably synthetic rubber. We should have an annual capacity of over 800,000 tons of this product by the end of 1944—more than we have ever used in a normal twelve-month period. A baffling task that will confront chemists in this industry will be to devise ways of using the great world surplus which will accumulate when peace comes. With the return of the Far Eastern plantations to their former owners, about 1,700,000 tons of natural rubber annually should be available from all sources. Dozens of new uses for rubber products must be found to prevent a serious glut on the market.

An Aluminium Surplus?

Discussion of prospective surpluses brings us to a consideration of the light metals. Because of the vastly expanded capacity of our aluminium reduction plants, many observers feel that a serious post-war problem will confront the industry. Other experts are inclined to be less pessimistic, however: they point out that if aluminium producers can sell 500 lb. of their metal for each automobile manufactured after the war—which is not beyond the realm of possibility—there would be no peace-time surplus. Among the many future uses predicted for aluminium are doors, engine castings, and rear-axle assemblies for automobiles; railway hopper wagons, household furniture, window frames and screens, lifeboats, and ship superstructures. Aluminium is quickly corroded by sea water, but the use of chromate alkyl resins for anti-corrosion is quite successful. Masts, decks, and housing will weigh so much less than steel that larger, lighter, and faster ships will be practicable.

One industry in which no American fears a surplus is that of petroleum products. A great debate is going on among experts in this field, many gloomily predicting that our oil resources may be nearing exhaustion in twenty years or less, at present rates of consumption. The work so far accomplished in producing petrol from coal has not been too encouraging. Latest data show that fuel derived from coal is about three times as expensive as that obtained from petroleum. Much encouraging progress has occurred in the improvement of engine fuels, the commercial production of Triptane being particularly noteworthy. This newest of the high-octane fuel oils has been thoroughly tested in aerial combat. It will unquestionably permit the design of much lighter and cheaper engines for post-war automobiles, and should eventually yield as high as 40 m.p.g. Commenting on Triptane, Dr. C. M. Stine, of the Du Pont Laboratories, recently observed: "Since automobile production stopped, the shiny

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new models that are gathering dust in dealers' showrooms have aged technically at least twenty years."

In the field of domestic insulation, the Goodyear Tyre and Rubber Company has announced a new material, made of a cotton-light synthetic resin. It is claimed that two inches of this type of insulation will be sufficient for the new plywood-exterior portable houses that are now being designed by the company for post-war production. The Goodyear Company has made another remarkable contribution to industrial production with its new adhesive, known commercially as Cycleweld. Developed in collaboration with technicians of the Chrysler Motor Corporation, it is expected to replace riveting and spot-welding altogether on light metals, particularly aluminium. The composition of the product is a military secret at the moment. It is a jet-black synthetic substance, which is sprayed or painted on the surface to be joined. Adhesion is produced by heat under pressure for fifteen minutes. Cycleweld produces a joint which is stronger, easier to build, and cheaper than riveting. It is already being used in wing flaps and structural sections of aircraft; also for fibre and wooden fuel tanks, as well as for hundreds of other aircraft parts.

Several large firms are planning to enter the field of gas air-conditioning after the war. Units already designed will provide heat in winter, cooled air in summer, and ventilation all the year round. A point emphasised by many engineers is that gas air-conditioning equipment has few moving parts to wear out, and is therefore the most logical approach to the problem.

Sandless Glass

After the war, sensational improvements in photography will be announced. Lenses are now being made which are much faster than the best we had up to 1940, and they are not made of glass. For centuries, glass has been made of sand, lime, and soda. The new lenses contain no sand. They are made of rare earths; their composition is known only to a few scientists, and cannot yet be revealed. Colour photography has entered a new phase, which will result in new commercial processes when peace comes. Electromagnetic photographs made on metal are already in use.

A distant possibility is the perfection of pigmented steels, for use in refrigerators, washing-machines, kitchen ranges and other household appliances. Also, there has been some talk of stainless steel roofs.

The war has taught us numerous lessons about the use of colour. For example, many industrial plants have inaugurated the practice of painting their cement floors white or ivory. Greatly improved light reflection has resulted, and the spirits of the workers have likewise been raised. Another recent practice has been the painting of certain parts of industrial machines in bright colours to contrast with the body of the machines. This technique has reduced accidents and speeded production. The use of yellow in place of red as the standard colour for danger is also being advocated in some quarters. It is recognised, of course, that red falls short of requirements because it lacks visibility. Yellow has been proved to be the most conspicuous and visible of all colours. Next in order are yellow-green, orange, and then red.

Plastics Advances

A striking glimpse of the growth of the plastics industry was furnished recently, with the publication of statistics estimating the total sales in the United States for 1943. This report showed that the figure would approach 500 million dollars, which is sixteen times the industry's output a decade ago. Glass also promises to be an important competitor to plastics and light metals for peace-time product design. It has been displacing steel and wood in kitchen cabinets, stoves and refrigerators. Glass will be used for roofing, dance floors, oven doors, food hydrators, and coiled springs. A house built entirely of specially-prepared glass bricks has been under test for more than a year, to determine the practicability of utilising the sun's rays for heating in winter. Although the experiments are not yet conclusive, preliminary reports show that heating costs were reduced by about one-third. The sun supplied enough heat to eliminate the use of the furnace in daylight, even in the coldest winter weather.

Completion of America's first all-plywood house recently focussed attention on the coming importance of this material for a myriad of post-war applications. Current technique, involving electronic heat treatment of the synthetic-resin-impregnated plywood, is producing a material which resists mild acids, fire, salt water, and the actinic rays of the sun. Plywood may well become an important structural material. It is also expected that it will be used in window sills, furniture, shop fronts, and ship decking. The ultimate goal of research chemists in this field is a plywood that cannot be kindled by fire.

Industrial effluent transmitted through a watercourse is suspected as the cause of the poisoning of the waters of the River Kennet and the Kennet and Avon Canal in the neighbourhood of Newbury and Thatcham, Berks. No less than eight hundredweight of dead fish of all types and sizes were taken from the waters last week, and it is believed that two or three years must elapse before the waters recover their purity.

U.S. Chemical Plant Construction

Huge Programme Nearing Completion

From a Correspondent

IT is estimated that, for the twelve months ending June 30, 1944, construction of new chemical plant in the U.S.A. will be at least as great as, and possibly greater than, that for the preceding year—that is, even without any addition to the existing large rubber, oil, and explosive factories. The position is a little complex owing to the fact that while war needs in some directions are supposed to have reached their peak, and in others that condition is being rapidly approached, in certain important fields there is still a shortage, due in many cases, of course, to actual scarcity of essential raw material. The U.S. Government, and more particularly the War Production Board, evidently takes the view that, the chemical industries, of basic national importance in peace and war, must be maintained at maximum capacity, at least to the extent necessary to meet almost overwhelming world demands at the end of the war. There will then doubtless be surplus plant, and possibly surplus factories. The transition to peace activities will be difficult, but allowing for this it has been definitely decided that much new plant will still be needed and should in fact be installed during the next twelve months. Thus the War Production Board already has its eyes on the more or less distant horizon and the first gleams of peace, while at the same time neglecting nothing in the matter of war demands.

Plant for Fertilisers

Special attention is being paid to present and prospective fertiliser demands, including more particularly sulphuric acid and superhosphate. For the first two or three years after the war the U.S.A. will have to be the granary and general stores for the whole world. Thus fertilisers will rank high in the programme, and an estimate of $25,000,000 expenditure on plant for manufacturing the necessary materials is held to be very conservative. American farms alone will probably need 10,000,000 tons. The trouble here is that many of the sulphuric acid plants now working for the explosives industry are located very far from the Southern States, where most of the fertiliser will be wanted, and where the superphosphate must be made. On the other hand, sulphuric acid is used for many things besides superphosphate. Another raw material for fertilisers, namely ammonia, is already in plentiful supply, and there is risk of a surplus. But this risk will be reduced if the attempts recently made to render ammonium nitrate more adaptable for fertiliser purposes, by limiting its caking propensities, meet with success, as seems likely.

Chemicals for the textile field will also be in large demand, and an estimate for necessary new plant is up to $20,000,000 for the 1943-44 period. Possibly half of this sum will be required for new acetic acid plant alone, despite an already largely increased capacity, to meet the anticipated huge rayon demands.

Catalyst Development

In the aviation field it is anticipated that the demand for chemicals will be almost unlimited, especially those needed for high-octane motor spirit, including anti-knock fuel, involving heavy calls for alkali, acid, chlorine and other heavy chemicals. It was not apparently possible to name any limited figure for expenditure on plant for these requirements. They will, however, play an important part in stimulating demand for plant in that large and varied field collectively grouped as catalytic processes. Catalysts are not only used for production of high-octane fuel, but also for synthetic rubber, hydrogenation of oils, etc. Important developments have taken place in recent years in the use of silica gel and of other improved types of catalyst. Plant expenditure in the catalytic group for the period under review is estimated at $10,000,000 as a minimum.

Drugs, pharmaceuticals, food processing, dietary aids and the like are said to have achieved enormous progress during the past five years. One has only to mention penicillin, synthetic vitamins, quinine substitutes, and the sulphonamide drugs, to envisage some of the giant strides made on behalf of public health during the war years. Plant expenditure for these vital industries will be of the order of at least $12,000,000 during 1943-44. And this is only part of a much larger territory comprising synthetic chemicals generally. Even the manufacturers of cosmetics, which in normal times is a vast American industry, but now temporarily restricted, is not being overlooked in the present planning.

But though thus looking ahead and to some extent working on the assumption that peace may not be far off in 1945, it is generally agreed that the greater part, if not the whole, of this projected new plant will be wanted whether peace arrives or not; and in any case the biggest item in the pro-

gramme still remains to be noted, that is military engineering. This still demands more attention than anything else, so far as the immediate present is concerned. Its requirements change with bewildering rapidity; there is always something new; always new adaptations of existing plant or installation of entirely new plant, the figure for which seldom falls below $20,000,000 at any one time.

The actual construction of new factories is now nearly completed, and at the end of June the programme, according to Mr. Donald Nelson, was more than 80 per cent. complete. But the allocation of manpower to the best purpose becomes more and more difficult, for the W.P.B. realises, among many other things, that the demands on civilian account must not be allowed to fall below a certain minimum; or, in other words, the civilian workers' needs must not be brought too near the essential margin. At the same time a sudden increase in military demands must be provided for.

Australian Official Research

Important Contributions to Industrial Chemistry

THE progress made by the Australian Government's Division of Industrial Chemistry is described, so far as security considerations allow the results of new researches to be published, in the 16th annual report of the Council for Scientific and Industrial Research, for the year ended June 30, 1942. Early in the year this division of the Council moved into its own laboratory, and may now be said to be well established. Under the direction of Dr. I. W. Wark, D.Sc., F.A.C.I., M.A.I.M.E., and with Mr. L. Lewis, B.Met.E., as secretary, the division has a staff of about 30 research workers. The staff of laboratory and technical assistants is being augmented with the immediate object of increasing the amount of equipment that can be made in the Council's own workshops, and with the ultimate aim of acquiring a complete set of pilot-plant equipment for the various unit operations of industrial chemistry. This plant will then be available to assist industry in the development of new processes and in the setting up of established processes based on Australian raw materials. An analytical section has been established, and also, in conjunction with the Division of Areonautics, a section of physical metallurgy. Cement investigations have begun in the division's laboratory; the Cement Manufacturers' Association has undertaken to provide half the costs for five years. One of the division's major activities has been an investigation of the technical feasibility and economics of several processs suggested for the production of alumina; this work was undertaken at the request of the Minister for Supply and Development. Certain work in connection with wool, ceramics, and paint and varnish has had to be deferred.

The laboratory has worked out the chemical treatment necessary to convert monazite sand into the cerium-iron pyrophoric alloy used in sparking lighters and metallurgical processes; the first Australian firm to attempt to make this product has started its manufacture. Experimental investigations were made into the application of the chlorination method for the decomposition of monazite directly into anhydrous rare-earth chlorides, and chlorination was also investigated as a possible means of decomposing the mineral or freeing it from ferruginous impurity. In the preparation of chromic chloride and in the chlorination of monazite the division finds that contamination of the final product by carbon can be avoided by the introduction of carbon tetrachloride in the chlorine stream. The laboratory reviewed the conventional methods for the production of synthetic cryolite, and found it desirable to investigate an alternative method based primarily on the interaction of fluorite and alunite in acid solution. A flake graphite almost devoid of impurities has been obtained by a process of beneficiation worked out by the division; the material is suitable for such special uses as in lubricants, powder metallurgy, and commutator brushes. Another beneficiation technique has been perfected, to provide a grade of pyrolusite that can be used as a depolarising agent in the manufacture of dry electric cells; this particular work aims at avoiding the importation of special grades of pyrolusite, but is itself only part of a larger research programme concerned with the general hydrometallurgy of manganese ores.

An investigation by two of the division's officers, in conjunction with scientists of the University of Western Australia, into the production of potash fertiliser from alunite —$K_2Al_6(OH)_{12}(SO_4)_4$—has led to the decision to establish an important new industry in Western Australia. The investigations have now been extended to determine the practicability of producing high-grade alumina for aluminium production from the residues left after extraction of the potash.

Another problem receiving attention is the flotation of the sulphide ores of copper,

lead, and zinc. In the preparation of high-grade concentrates, oxidation is thought to be responsible for the difficulties that are encountered. So far, the investigations, which are intricate, have not reached a stage at which deductions of practical value are possible, though it has been shown that both major and minor constituents of the ores may cause some of the flotation difficulties.

It is interesting to note that a method akin to flotation is being applied to the separation of two materials of plant origin (one of which is required for an essential drug).

The laboratory is now equipped with an almost complete range of modern sand-testing equipment, enabling the division to give valuable advice to foundries faced with the problem of casting unfamiliar alloys required for munitions.

Ethylene Derivatives

In the field of organic chemistry researches were carried out on ethylene and its derivatives. The method of producing ethylene from ethanol has been examined, particularly with regard to the most suitable catalyst; an effective clay catalyst was found which, at 380°-390°C., gave an ethylene of 92-96 per cent. purity in yields exceeding 90 per cent. of the theoretical, and often reaching 96 per cent. A generator was put into operation with an output of 250-300 litres per hour, and a larger pilot plant is under construction. This ethylene has been used to discover its value as a source of formaldehyde, ethylene oxide, and ethylene glycol. Conversion of ethylene into the chlorhydrin has been examined and, from the laboratory results obtained, an apparatus was designed and operated to produce the amount of this chemical that is required for synthesising sufficient novocaine to meet Australian needs. Oxidation of methane to formaldehyde has also received attention; though the yield of formaldehyde by this method is not expected to be so high as from ethylene, the process seems to have certain compensating advantages.

Furfural Resins

The laboratory also began investigations in the field of synthetic resins. The primary concern was the production of adhesives needed in the manufacture of laminated wood. The laboratory has developed an analytical technique to be used in controlling the preparation of cresol-formaldehyde resins. Resins of the phenol-furfural and cresol-furfural class are being studied, as the use of furfural in resin production would relieve the demand on formaldehyde supplies. Furfural could be produced relatively simply from waste materials like oat husks and bagasse, and its production in Australia seems desirable. The laboratory has also given advice in connection with methyl methacrylate sheets.

Wood chemistry has been an important item in the programme of the Forest Products Division. Besides investigations into the extraction of "native lignin" by means of ethanol and methanol, this division has also done research into the problem of wood preservation. An attempt was made to find a suitable method of constructing vats needed for the treatment of solid wood with boric acid; wooden vats proved to be most satisfactory for this purpose. One inquiry made by this laboratory has the attraction, at least for British chemists, of novelty—it concerned the termite-proofing of certain defence structures! The division also gave assistance in the preparation of a phenolic resin for use as an adhesive in impregnated paper, and in the development of a method for making rennet casein suitable for employment as a plywood adhesive; a fairly large amount of rennet casein, not needed by the plastics industry, is available and can be used to augment supplies of lactic casein for glue-making purposes.

Vitamin C

Chemists of the Food Storage Division made a survey of the vitamin-C content of various Australian fruits; rose-hips were found to contain 300-800 mgm. per 100 gm., the highest values being associated with hips from Southern Tasmania. Extracts and concentrates containing up to 1200 mgm. vitamin C per 100 gm. were obtained from the hips and used to fortify jam, tomato sauce and soup, etc. A concentrated vitamin-C extract was also prepared from the waste skins of passion fruit, its vitamin content being 100-150 mgm. per 100 gm.

The Fisheries Investigation Division was responsible for trying to find sources for a substitute agar; the seaweed *Gracilaria confervoides* was found suitable, and a process developed for extracting the agar (which is described in detail in the report) is now being operated in the plants of two Sydney firms. The report remarks that there seem to be possibilities of producing agar at a price allowing export, even in peace time and at pre-war prices. The manufacture of alginates (for use as emulsion-stabilisers, etc.) from brown seaweeds is also under consideration; and the preparation of vitamin oils from such fish as the black-fin shark and the blue-fin tuna is also being investigated.

The proceedings of the recent London conference of the National Smoke Abatement Society on smoke prevention in post-war reconstruction have now been published, price 1s. and are obtainable through booksellers or direct from the Society, Chandos House, Buckingham Gate, London, S.W.1.

Parliamentary Topics

British Synthetic Rubber : "Clearing House" for Research

LAST week in the House of Commons Mr. Parker asked the Minister of Supply, in view of his responsibility for the supply of crude, synthetic, reclaimed rubber and substitutes, whether he was consulted by the Ministry of Production prior to licences for steel, iron and timber being granted to British Celanese for the manufacture of a synthetic rubber plant in this country; and if this matter was considered by the Advisory Committee whose function it is to advise him on these matters. Mr. Charles Peat replied in the negative, adding that the responsibilites in these matters rested with the Minister of Production.

Disposal of Surplus Explosives

Mr. E. P. Smith asked the Minister of Supply what steps were being taken to utilise the nitrogen stored in high explosives and ammonium nitrate, which are likely to become surplus after the war; and whether research was being carried out in this country on the same lines as in Canada and the U.S.A., with a view to the full utilisation of these valuable materials.

The Joint Parliamentary Secretary to the Ministry of Supply (Mr. Sandys) replied that plans were being made for utilising surplus stocks of explosives and for recovering some of their more valuable constituent products. In this connection certain necessary experimental work was in hand.

Penicillin

Commander Locker-Lampson asked the Minister of Supply whether he would take steps to ensure that penicillin, when used, would be available for poor patients and not only for the well-to-do.

The Joint Parliamentary Secretary to the Ministry of Supply (Mr. Peat) said that before any penicillin was allotted for civilian use, which could not be for some time yet, the Minister of Supply would consult the Minister of Health with a view to securing that it was made available for those purposes which should have priority on medical grounds.

Commander Locker-Lampson : May I ask to whom penicillin belongs and whether so valuable and vital a product ought not to be the property of the nation?

Mr. Peat : I should like to have notice of that question.

Integration of Research

Rear-Admiral Sir Murray Sueter asked the Lord President of the Council whether, in considering the question of scientific research and the universities in post-war Britain, he would also consider setting up a scientific research clearing bureau to enable research results at the universities, other research centres, Government laboratories, etc., to be made easily available to all Services and industry, and that the necessary steps be taken to improve the liaison between all in this respect.

The Lord President of the Council (Mr. Attlee) : Yes, Sir. In the preparation of plans for the organisation after the war of scientific research in the national interest, special consideration will be given to improving the existing ways in which the results of scientific research can best be made known and applied to the development of industry and the Fighting Services. The examination given to previous proposals for a clearing house for scientific research suggests, however, that this may not be the best way of achieving the desired result.

Emergency Laboratory Service

Mr. E. P. Smith asked the Minister of Health whether his attention had been drawn to the action of directors of emergency public health laboratories in soliciting chemical and bacteriological practice in competition with public analysts, consulting chemists and bacteriologists; and since such action was contrary to the intention expressed in the circular letter issued by the Minister in September, 1939, that the scheme should not interfere in any way with the operation of normal services, if he would take steps to put a stop to this practice.

Mr. Willink said he was at present making inquiry into particular cases, brought to his notice by representatives of public analysts, in which they considered that work had been improperly diverted from public analysts.

WELDING ALUMINIUM ALLOYS

The British Standards Institution has just issued B.S. 1126, relating to the gas-welding of certain aluminium alloys. The specification gives details of the quality of material which can be gas-welded by reference to the appropriate British Standards for various aluminium alloys. They cover material in the form of sheet castings, tubes, bars and sections. An appendix gives the details of chemical composition and mechanical properties of all the alloys quoted. Other clauses cover such requirements as the quality of filler rod, the flux (a suggested composition is also given), type of joint, mechanical tests and inspection. Illustrations of recommended forms of joint are also shown. Copies of the specification can be obtained from B.S.I., 28 Victoria Street, London, S.W.1, price 2s. each.

LETTERS TO THE EDITOR

Glass-Forming Properties

SIR,—Several approaches have been made to determine whether an element, or its oxide, acts as a network-former in glass, such as SiO_2, B_2O_3, etc., or as a stabiliser like CaO, or as an intermediate like Al_2O_3.

Kuan Han-Sun and A. Silverman (*J. Am. Ceram. Soc.*, 1942, 97; abstr. in *J. Soc. Glass Techn.*, 1942, 43) introduced the ρ-value of an oxide, or more generally of a compound, as the characteristic indicator. The ρ-value was defined as the quotient of the radius of the respective ion and that of oxygen, or the attached anion: $\rho = \frac{ri}{rO\ (ra)}$. They found, for instance, that the glass formers, as a rule, had a ρ-value below 0.41. The ionic potential was used with good results for the same purpose. (A. G. Pincus, *Ceram. Age*, Feb., 1942, 38). This quotient of valency and ionic radius yields special values for the network formers, the alkalis, etc. However, some values overlap, such as that for barium, 1.4, and lithium, 1.5; others differ rather widely.

The present writer proposes the "σ-value" as the criterion for the glass forming property of an element or compound: $\sigma = \frac{vc \cdot \sqrt{ra}}{va \cdot \sqrt{rc}}$ (where vc is the valency of the cation, rc the ionic radius of the cation; ra ionic radius of the anion, and va valency of the anion). The alkali oxides have a σ-value from 0.44 to 0.70; the stabilisers from 0.98 to 1.40; the σ-value for the intermediates ranges from 2.04 to 2.40; and for the network formers from about 3.14 to 5. No overlapping takes place: Ta_2O_5 and Cb_2O_5 with σ-values of 3.29 and 3.42 would be classified as glass-formers, a conclusion differing from that derived from the ρ-values, but more in agreement with the facts.—Yours faithfully,

BRUNO SCHWEIG.

January 24, 1944.

Nitriding

SIR,—I have read Mr. Allott's letter published in your issue of January 15. I cannot agree that my remarks are in any way an impeachment of his company. In the first place, I do not infer that the development of this process has been retarded by them. On the contrary, I agree that their efforts have rendered a very good service to the metallurgical world, as Mr. Allott suggests. In the second place, however, he must agree that if only 50 or so firms have their own nitriding equipment, there will remain a large number who will need to send out their work. My remarks were a general summary of reasons why nitriding had not replaced carburising, other things being equal, and as such they remain true.—Yours faithfully,

L. G. WHYBROW PALETHORPE.

January 20, 1944.

Muriate of Potash

SIR,—I was not aware that the bulk of the muriate of potash reaching this country since the war came from Palestine, and I need hardly say that I welcome the letter of Mr. G. A. Stolar (of Palestine Potash, Ltd.), to this effect. That supplies were reaching this country from Palestine, America, Russia, and Spain was known to me, and the information that I had in my possession at the time I wrote my contribution concerning "Conditions in, and some war problems of, the heavy chemical industry in 1943" was that the largest supplies were coming from America and Russia.

I appreciate Mr. Stolar's correction.—Yours faithfully,

P. PARRISH.

January 24, 1944.

Insecticides and Fungicides

Ministry Approves Proprietary Products

IN 1943 applications were invited by the Ministry of Agriculture and Fisheries and the Department of Agriculture for Scotland for the approval of proprietary lead arsenate powders, lead arsenate pastes, lime sulphur washes, miscible tar-oil winter washes, stock emulsion tar-oil winter washes, and organo-mercury dry seed dressings containing organo mercury compounds as the sole active principle. The initial list of approved products in these groups has been published in the Ministry of Agriculture's journal *Agriculture* (1944, *50*, 10, p. 478), and additions to the list will be given in the same journal from time to time.

The Ministry and the Department are now prepared to receive applications for approval in the groups copper sulphate, copper fungicides exclusive of seed dressings, and products having rotenone-containing resins as the main active principle. Applicants must be either the manufacturer or the authorised agent under whose name the product is sold. For a product sold and used in Great Britain but manufactured elsewhere, application will be accepted from the authorised selling agent resident in Great Britain who will be required to accept responsibility for breach of any undertaking or condition on the strength of which any approval may be granted.

Requests for application forms, and for particulars of the scheme, should be sent to the Secretary of the Advisory Committee, Plant Pathology Laboratory, Milton Road, Harpenden, Herts.

Personal Notes

COL. EDGAR PAM, D.S.O., is the new President of the Institution of Mining and Metallurgy.

MR. A. E. HEWITT has succeeded MRS. D. A. WALLETT as chairman of the National Council of the Pottery Industry, Stoke-on-Trent.

MR. W. J. PIGGOTT, who will remain as secretary and commercial manager, was elected a director of B. Laporte, Ltd., Luton, on Monday, January 24.

DR. ALEXANDER ROBERT URQUHART, D.Sc., F.I.C., research superintendent, Lansil, Ltd., Lancaster, has been elected a Fellow of the Textile Institute.

MR. C. SYKES is leaving his post as superintendent of the metallurgy department of the National Physical Laboratory to become principal of the Brown-Firth Research Laboratories, and technical adviser to the Firth-Brown group of companies.

MR. R. B. BICKERDIKE has retired from his post at the Eagle Chemical Works, Church, Lancs., after 38 years in the chemical trade. The remaining partner, Mr. H. E. J. Cory, will continue the business as sole proprietor.

MR. E. D. WHITELOCK, M.I.Chem.E., chief engineer, and MR. L. WEAVER, commercial manager, have both been appointed directors of Brotherton & Co., Ltd. MR. F. H. S. MCDAVID has been appointed deputy chairman of the company.

MR. STANLEY ROBSON, honorary foreign secretary of the Society of Chemical Industry, and MR. D. J. W. ORR have been appointed to the board of the Imperial Smelting Corporation, Ltd. Mr. Robson is also to become director-general of a new research and development organisation which the Imperial Smelting Association is forming in association with certain Australian interests.

Their Majesties the King and Queen have sent their congratulations to CAPTAIN and MRS. JOHN ROWSE on the occasion of their diamond wedding anniversary. For over half a century Captain Rowse was associated with the china clay industry in mid-Cornwall, retiring some eleven years ago from the works management of the Wheal Henry china clay works at Bugle. Mrs. Rowse is a daughter of the late Captain Silas Pascoe; her great-grandfather founded one of the first companies as far back as 1828, when the firm of John Lovering, Martin and Pascoe was formed.

Obituary

DR. JOSEF BLAUHORN, who died in London on January 15, aged 61, after a long illness, was one of the many prominent Central European technologists who in 1938 took refuge in England from Nazi oppression. He studied at Vienna University and, after a period as secretary of the Federation of the Austrian Mining and Metallurgical Industry, he played a leading part in the international coal and iron industry, as a director of the famous Vitkovice Mines, Steel and Ironworks Corporation, Czechoslovakia. He was also on the board of many other industrial companies both at home and abroad. His thesis on "Mining Law in the Galician Oil Industry" received the highest award of Vienna University in the field of Industrial Law.

CALCIUM ALGINATE SUPPLIES

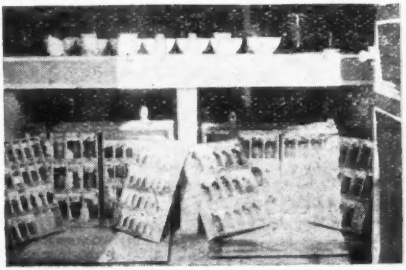
Although there is a temporary shortage of sodium alginate (Manucol), which is being used increasingly in certain essential work, ample supplies of calcium alginate are available. The calcium salt is insoluble in water, but viscous solutions can readily be prepared by the addition of certain sodium salts. A simple method of preparing such solutions is to disperse the calcium alginate in water and add a solution of soda ash or suitable sodium salt: sodium sesquicarbonate or citrate can also be used. There are a number of applications of these viscous solutions. They can, for example, be used to stabilise emulsions and dispersions and to thicken solutions.

Calcium alginate is made in three grades from which solutions of different viscosity can be obtained by the method described above. Suggestions for using calcium alginate can be obtained on application to Albright & Wilson, Ltd., Oldbury, Birmingham.

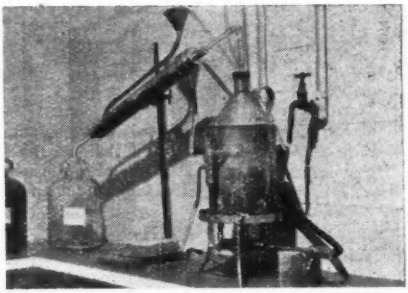
ARMY ANALYSTS IN NORTH AFRICA

IN order to make sure that the British soldier's food is maintained at a high standard, rations are inspected in the field by qualified officers on the staff of the Supply Services. These officers advise on technical problems connected with the feeding of the Army, help in the selection of locally manufactured products, and exercise close supervision over the quality of food purchased by the Army in the field. Some of their activities are illustrated on the opposite page.

An army analyst measuring sugar content.

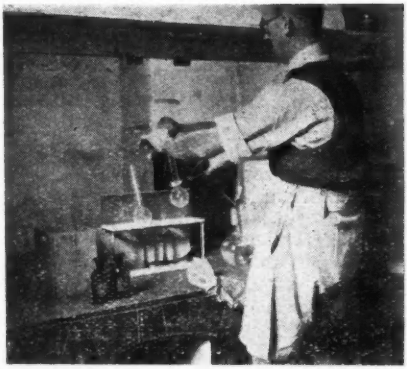


Reagent cases captured from the enemy.

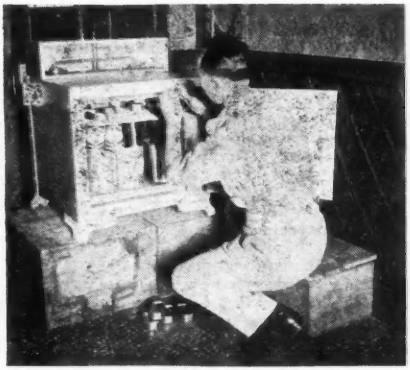


A still used by War Department analysts in the field.

A chemist testing a sample of flour.



Much attention is devoted to the condition of tinned foodstuffs. Here a sample is examined for possible metallic contamination.



Tins of food being incubated at 56°C. to detect the pressure of putrefractive bacteria.

ARMY ANALYSTS IN NORTH AFRICA

Prices of British Chemical Products

THERE have been no changes of importance in the London chemicals market during the past week and most sections report a sustained demand. A steady volume of inquiry for new business is reported, although in many cases the supply position has restricted actual bookings. Contracts to the chief consuming industries continue on a satisfactory scale and throughout the market prices remain firm. Among the soda products an active inquiry is circulating for bicarbonate and nitrate of soda, while values for chlorate and yellow prussiate of soda are strong, with supplies scarce. In the acid section, oxalic, tartaric, and citric continue to be absorbed in good quantities and a steady movement is reported in acetic acid at controlled levels. With regard to the potash chemicals, supplies of yellow prussiate of potash remain scarce, while a good demand is reported for permanganate of potash, caustic, and carbonate of potash. Acid phosphate of potash is steady. Elsewhere formaldehyde is active and there is a moderate inquiry for alum lump and aluminium sulphate. White powdered arsenic and sulphur are good markets. The chief activity in the coal-tar products market is concerned with the deliveries against contract commitments, and prices generally remain strong.

MANCHESTER.—On the Manchester chemical market during the past week a steady trade has been reported in the leading heavy products, including alkalis, magnesia and ammonia compounds, and both light and heavy acids, mainly against contract commitments, though a moderate weight of new business has been placed. Fair quantities of a wide range of materials have been taken up by the textile and allied industries both in Lancashire and the West Riding of Yorkshire. There is a generally strong undertone in the market for by-products, most of which are meeting with a ready demand.

GLASGOW.—In the Scottish heavy chemical trade there has been a steady demand during the past week for home business. Export trade remains rather limited. Prices keep very firm at previous levels.

Price Changes

Rises: Arsenic; lead, red; lead, white (ground in oil); linseed oil; naphthalene; pitch (Manchester); potash, caustic; rapeseed oil; sodium metasilicate; sodium phosphate.

Falls: Copper sulphate; lactic acid; pyridine; toluol (pure).

General Chemicals

Acetic Acid.—Maximum prices per ton: 80% technical, 1 ton £39 10s.; 10 cwt./1 ton, £40 10s., 4/10 cwt., £41 10s.; 80% pure, 1 ton, £41 10s.; 10 cwt./1 ton, £42 10s.; 4/10 cwt., £43 10s.; commercial glacial, 1 ton, £49; 10 cwt./1 ton, £50; 4/10 cwt., £51; delivered buyers' premises in returnable barrels, £4 10s. per ton extra if packed and delivered in glass.

Acetone.—Maximum prices per ton, 50 tons and over, £65; 10/50 tons, £65 10s.; 5/10 tons, £66; 1/5 tons, £66 10s.; single drums, £67 10s.; delivered buyers' premises in returnable drums or other containers having a capacity of not less than 45 gallons each. For delivery in non-returnable containers of 40/50 gallons, the maximum prices are £3 per ton higher. Deliveries of less than 10 gallons free from price control.

Alum.—Loose lump, £16 per ton, f.o.r.

Aluminium Sulphate.—£11 10s. to £11 15s. per ton d/d.

Ammonia, Anhydrous.—1s. 9d. to 2s. 3d. per lb.

Ammonium Carbonate.—£38 per ton d/d in 5 cwt. casks.

Ammonium Chloride.—Grey galvanising, £22 10s. per ton, in casks, ex wharf. Fine white 98%, £19 10s. per ton. See also Salammoniac.

Antimony Oxide.—£111 to £117 per ton.

Arsenic.—99/100%, under 1 ton, £62; 1 ton, £61; white 98/99%, £59; grey 96/97%, £54; grey 95/96%, £52; crude, £35 per ton.

Barium Carbonate.—MANCHESTER: precip., 4-ton lots, £16 per ton d/d; 2-ton lots, £16 5s. per ton.

Barium Chloride.—98/100%, prime white crystals, £16 10s. to £19 10s. per ton, bag packing, ex works.

Bleaching Powder.—Spot, 35/37%, £11 to £11 10s. per ton in casks, special terms for contract.

Borax, Commercial.—Granulated, £31 10s.; crystals, £32 10s.; powdered, £33; extra fine powder, £34; B.P. crystals £40 10s.; powdered, £41; extra fine, £42 per ton for ton-lots, in free 1-cwt. bags, carriage paid in Great Britain. Borax Glass, lump, £83; powder, £84 per ton in tin-lined cases for home trade only, packages free, carriage paid.

Boric Acid.—Commercial, granulated, £52 15s.; crystals, £53 15s.; powdered, **£54 15s.; extra fine powder, £56 15s.**; B.P. crystals, £61 15s.; powdered, £62 15s.; extra fine powdered, £64 15s. per ton for ton lots in free 1-cwt. bags, carriage paid in Great Britain.

Calcium Bisulphide.—£6 10s. to £7 10s. per ton f.o.r. London.

Calcium Chloride.—70/72% solid, £5 15s. per ton, ex store.

Charcoal, Lump.—£10 10s. to £14 per ton, ex wharf. Granulated, supplies scarce.

Chlorine, Liquid.—£23 per ton, d/d in 16/17 cwt. drums (3-drum lots).

Chrometan.—Crystals, 5½d. per lb.

Chromic Acid.—1s. 5d. per lb., less 2½%, d/d U.K.

Citric Acid.—Controlled prices per lb., d/d buyers' premises. For 5 cwt. or over, anhydrous, 1s. 6½d., other, 1s. 5d.; 1 to 5 cwt., anhydrous, 1s. 9d., other, 1s. 7d. Higher prices for smaller quantities.

Copper Oxide.—Black, powdered, about £100 per ton.

Copper Sulphate.—£31 5s. per ton, f.o.b., less 2%, in 2 cwt. bags.

Cream of Tartar.—100%, £13 2s. per cwt., less 2½%, d/d in sellers' returnable casks.

Formaldehyde.—£24 to £27 per ton in casks, according to quantity, d/d.

Formic Acid.—85%, £47 per ton for ton lots, carriage paid; smaller parcels quoted up to 50s. per cwt., ex store.

Glycerine.—Chemically pure, double distilled 1260 s.g., in tins, £4 to £5 per cwt., according to quantity; in drums, £3 19s. 6d. Refined pale straw industrial, 5s. per cwt. less than chemically pure.

Hexamine.—Technical grade for commercial purposes, about 1s. 4d. per lb.; free-running crystals are quoted at 2s. 1d. to 2s. 3d. per lb.; carriage paid for bulk lots.

Hydrochloric Acid.—Spot, 7s. 6d. to 8s. 11d. per carboy d/d, according to purity, strength and locality.

Hydrofluoric Acid.—59/60%, about 1s. to 1s. 2d. per lb.

Iodine.—Resublimed B.P., 10s. 4d. to 14s. 6d. per lb., according to quantity.

Lactic Acid.—Pale tech., £47 per ton; dark tech., £40 per ton ex works; barrels returnable.

Lead Acetate.—White, 50s. 6d. to 52s. 6d. per cwt. MANCHESTER: £51 to £54 per ton.

Lead Nitrate.—About £47 per ton d/d in casks.

Lead, Red.—English, 5/10 cwt., £45 per ton; 10 cwt. to 1 ton, £44 15s.; 1/2 tons, £44 10s.; 2/5 tons, £44; 5/20 tons, £43 10s.; 20/100 tons, £43; over 100 tons, £42 10s. per ton, less 2½%, carriage paid. Non-setting red lead, 10s. per ton dearer in each case.

Lead, White.—Dry English, less than 5 tons, £57; 5/15 tons, £53; 15/25 tons, £52 10s.; 25/50 tons, £52; 50/200 tons, £51 10s. per ton, less 5% carriage paid. Ground in oil, English, 5/9 cwt., £69; 10 cwt., £68 10s.; 1/2 tons, £67 10s.; 2/5 tons, £66; 5/10 tons, £64; 10/15 tons, £63; 15/25 tons, £62 10s.; 50/100 tons, £61 10s. per ton, less 5% carriage paid.

Litharge.—1 to 2 tons, £44 10s. per ton.

Lithium Carbonate.—7s. 9d. per lb. net.

Magnesite.—Calcined, in bags, ex works, £18 15s. to £22 15s. per ton.

Magnesium Chloride.—Solid (ex wharf), £16 to £18 per ton. MANCHESTER: £15 to £17 per ton.

Magnesium Sulphate.—Nominal.

Mercury Products.—Controlled price for 1-cwt. quantities: Bichloride powder, 15s. 8d.; bichloride lump, 16s. 3d.; mercury oxide, red cryst., 20s. 9d.; red levig., 20s. 3d.; red tech., 19s. 11d.; yellow levig., 20s. 2d.; yellow tech., 19s. 7d.; sulphide, red, 17s. 9d.

Methylated Spirit.—Industrial 66° O.P. 100 gals., 2s. 4d. per gal.; pyridinised 64° O.P. 100 gals., 2s. 5d. per gal.

Nitric Acid.—£24 to £26 per ton, ex works.

Oxalic Acid.—£60 to £65 per ton for ton lots, carriage paid, in 5-cwt. casks; smaller parcels would be dearer; deliveries slow.

Paraffin Wax.—Nominal.

Potash, Caustic.—Solid, £65 10s. per ton for 1-ton lots; flake, £73 per ton for 1-ton lots. Liquid, d/d, nominal.

Potassium Bichromate.—Crystals and granular, 7¾d. per lb.; ground, 8¾d. per lb., for not less than 6 cwt.; 1-cwt. lots, ½d. per lb. extra.

Potassium Carbonate.—Calcined, 98/100%, £67 5s. per ton ex store; hydrated, £61 10s. per ton.

Potassium Chlorate.—Imported powder and crystals, nominal.

Potassium Iodide.—B.P., 8s. 8d. to 12s. per lb., according to quantity.

Potassium Nitrate.—Small granular crystals, 76s. per cwt. ex store, according to quantity.

Potassium Permanganate.—B.P., 1s. 10d. per lb. for 1 cwt. lots; for 3 cwt. and upwards, 1s. 9½d. per lb.: technical, £7 18s. 6d. to £8 10s. 6d. per cwt., according to quantity d/d.

Potassium Prussiate.—Yellow, nominal.

Salammoniac.—First lump, spot, £48 per ton; dog-tooth crystals, £50 per ton; medium, £48 10s. per ton; fine white crystals, £19 10s. per ton, in casks, ex store.

Soda, Caustic. — Solid 76/77%; spot, £16 7s. 6d. per ton d/d station.

Sodium Acetate.—£41 per ton, ex wharf.

Sodium Bicarbonate.—Refined, spot, £11 per ton, in bags.

Sodium Bichromate.—Crystals, cake and powder, 6½d. per lb.; anhydrous, 6¼d. per lb., net, d/d U.K.

Sodium Bisulphite Powder.—60/62%, £19 10s. per ton d/d in 2-ton lots for home trade.

Sodium Carbonate Monohydrate.—£21 per ton d/d in minimum ton lots in 2 cwt. free bags.

Sodium Chlorate.—£36 to £42 per ton, nominal.

Sodium Hyposulphite.—Pea crystals, £21 10s. per ton for 2-ton lots; commercial, £15 per ton.

Sodium Iodide.—B.P., for not less than 28 lb., 9s. 11d. per lb., for not less than 7 lb., 13s. 1d. per lb.

Sodium Metasilicate.—£16 10s. per ton, d/d U.K. in ton lots.

Sodium Nitrite.—£20 to £23 10s. per ton for ton lots.

Sodium Percarbonate.—21½% available oxygen, £7 per cwt.

Sodium Phosphate.—Di-sodium, £26 10s. per ton d/d for ton lots. Tri-sodium, £30 per ton d/d for ton lots.

Sodium Prussiate.—9d. to 9½d. per lb. ex store.

Sodium Silicate.—£6 to £11 per ton.

Sodium Sulphate (Glauber Salt).—£4 10s. per ton d/d.

Sodium Sulphate (Salt Cake).—Unground. Spot £4 11s. per ton d/d station in bulk. MANCHESTER: £4 15s. per ton d/d station.

Sodium Sulphide. — Solid, 60/62%, spot, £18 5s. per ton, d/d, in drums; crystals, 30/32%, £12 7s. 6d. per ton, d/d, in casks.

Sodium Sulphite.—Anhydrous, £29 10s. per ton; pea crystals, £20 10s. per ton d/d station in kegs; commercial, £12 to £14 per ton d/d station in bags.

Sulphur.—Per ton, for quantities of not less than 4 tons; ground, but not sieved, £15 10s.; ground and sieved, £17 15s. Controlled prices.

Sulphuric Acid.—168° Tw., £6 10s. to £7 10s. per ton; 140° Tw., arsenic-free, £4 11s. per ton; 140° Tw., arsenious, £4 3s. 6d. per ton. Quotations naked at sellers' works.

Tartaric Acid.—3s. 1½d. per lb., less 5% carriage paid for lots of 5 cwt. and upwards.

Tin Oxide.—Snow-white, controlled material, about 330s. per cwt.; free (nominal), 400s.-500s. per cwt.

Zinc Oxide.—Maximum prices per ton for 2-ton lots, d/d; white seal, £34; green seal, £33; red seal, £31 10s.

Zinc Sulphate.—Tech., £20-£21 per ton, carriage paid, casks free.

Rubber Chemicals

Antimony Sulphide.—Golden, 1s. 2d. to 2s. 1½d. per lb. Crimson, 2s. 2d. to 2s. 6d. per lb.

Arsenic Sulphide.—Yellow, 1s. 9d. per lb.

Barytes.—Best white bleached, £8 3s. 6d. per ton.

Cadmium Sulphide.—6s. to 6s. 6d. per lb.

Carbon Black.—6d. to 8d. per lb., according to packing.

Carbon Bisulphide.—£34 per ton, according to quality, in free returnable drums.

Carbon Tetrachloride.—£44 to £49 per ton, according to quantity.

Chromium Oxide.—Green, 2s ped lb.

India-rubber Substitutes.—White, 6 3/16d. to 10½d. per lb.; dark, 6 3/16d. to 6 15/16d. per lb.

Lithopone.—30%, £25 per ton; 60%, £31 to £32 per ton. Imported material would be dearer.

Mineral, Black.—£7 10s. to £10 per ton.

Mineral Rubber, "Rupron."—£20 per ton.

Sulphur Chloride.—7d. per lb.

Vegetable Lamp Black.—£49 per ton.

Vermilion.—Pale or deep, 15s. 6d. per lb. for 7-lb. lots.
Plus 5% War Charge.

Nitrogen Fertilisers

Ammonium Phosphate. Imported material, 11% nitrogen, 48% phosphoric acid, per ton d/d farmer's nearest station, in January, £20 10s. Increased charge of 2s. 6d. per month up to March, 1944.

Ammonium Sulphate.—PPer ton in 6-ton lots, d/d farmer's nearest station: January, £9 19s.; increased charge of 1s. 6d. per month up to March, 1944.

Calcium Cyanamide.—Nominal; supplies very scanty.

Concentrated Fertilisers. Per ton d/d farmer's nearest station: I.C.I. type "Special No. 1," January, £14 13s. 6d.; February, £14 16s.; March-June, £14 18s. 6d. Type "Special No. 2," January, £15 15s.; February, £15 17s. 6d.; March-June, £16.

"Nitro Chalk."—£9 14s. per ton in 6-ton lots, d/d farmer's nearest station.

Sodium Nitrate.—Chilean super-refined for 6-ton lots d/d nearest station, £15 5s. per ton; granulated, over 98%, £14 10s per ton.

Coal Tar Products

Benzol.—Crude, 60's, 1s. 11d.; pure, 2s. 6d., per gal., ex works.

Carbolic Acid.—Crystals, 11½d. per lb. Crude, 60's, 4s. 3d. to 4s. 6d., according to specification. MANCHESTER: Crystals, 9¾d. to 11½d. per lb., d/d; crude, 4s. o 4s. 6d., naked, at works.

Creosote.—Home trade, 6½d. to 7d. per gal., f.o.r. maker's works. MANCHESTER, 6½d. to 9¾d. per gal.

Cresylic Acid.—Pale, 97%, 3s. 6d. per gal.; 99%, 4s. 2d.; 99.5/100%, 4s. 4d. MANCHESTER: Pale, 99/100%, 4s. 6d. per gal.

Naphtha.—Solvent, 90/160°, 2s. 8d. per gal. for 1000-gal. lots; heavy, 90/190°, 2s. 2d. per gal. for 1000-gal. lots, d/d. Drums extra; higher prices for smaller lots. Controlled prices.

Naphthalene.—Crude, ton lots, in sellers' bags, £6 6s. 8d. to £9 7s. 7d. per ton, according to m.p.; hot-pressed, £11 5s. per ton, in bulk ex works; purified crystals, £19 to £35 per ton. Controlled prices.

Pitch.—Medium, soft, 50s. to 64s. per ton, f.o.b. MANCHESTER: 60s. to 62s. per ton f.o.b.

Pyridine.—90/140°, 17s. to 17s. 6d. per gal.; 90/160°, 13s.—MANCHESTER, 13s. 6d. to 18s. per gal.

Toluol.—Pure, 2s. 7d. per gal.; 90's, 1s. 11d. per gal. MANCHESTER: Pure, 2s. 7½d. per gal. naked.

Xylol.—For 1000-gal. lots, 3s. 1½d. to 3s. 4d. per gal., according to grade, d/d. Drums extra; higher prices for smaller lots. Controlled prices.

Wood Distillation Products

Calcium Acetate.—Brown, £21 per ton; grey, £24. MANCHESTER: Grey, £24 to £25 per ton.

Methyl Acetone.—40/50%, £56 per ton.

Wood Creosote.—Unrefined, about 2s. per gal., according to boiling range.

Wood Naphtha, Miscible.—4s. 6d. to 5s. 6d. per gal.; solvent, 5s. 6d. per gal.

Wood Tar.—£5 per ton.

Intermediates and Dyes (Prices Nominal)

m-**Cresol** 98/100%.—Nominal.

o-**Cresol** 30/31° C.—Nominal.

p-**Cresol** 34/35° C.—Nominal.

Dichloraniline.—2s. 8½d. per lb.

Dinitrobenzene.—8½d. per lb.

Dinitrotoluene.—48/50° C., 9½d. per lb; 66/68° C., 1s.

p-**Nitraniline.**—2s. 5d. per lb.

Nitrobenzene.—Spot, 5½d. per lb. in 90-gal. drums, drums extra, 1-ton lots d/d buyer's works.

Nitronaphthalene.—1s. 2d. per lb.; P.G., 1s. 0½d. per lb.

o-**Toluidine.**—1s. per lb., in 8/10 cwt. drums, drums extra.

p-**Toluidine.**—2s. 2d. per lb., in casks.

m-**Xylidine Acetate.**—4s. 5d. per lb., 100%

Latest Oil Prices

LONDON.—January 26.—For the period ending February 5 (March 4 for refined oils), per ton, naked, ex mill, works or refinery, and subject to additional charges according to package: LINSEED OIL, crude, £60. RAPESEED OIL, crude, £70. COTTONSEED OIL, crude, £52 2s. 6d.; washed, £55 5s.; refined edible, £57; refined deodorised, £58. COCONUT OIL, crude, £49; refined deodorised, £49; refined hardened deodorised, £53. PALM KERNEL OIL, crude, £48 10s.; refined deodorised, £49; refined hardened deodorised, £53. PALM OIL, refined deodorised, £55; refined hardened deodorised, £58. GROUNDNUT OIL, crude, £56 10s.; refined deodorised, £58; refined hardened deodorised, £62 to £63. WHALE OIL, crude hardened, 42 deg., £51 10s.; refined hardened, 46/48 deg., £52 10s. ACID OILS: Groundnut, £40; soya £38; coconut, and palm-kernel, £43 10s. ROSIN, 30s. 6d. to 45s. per cwt., ex store, according to grade. TURPENTINE, American, 87s. per cwt. in drums or barrels, as imported (controlled price).

General News From Week to Week

Leith Chamber of Commerce is moving, at the end of February, to larger premises at 27 Charlotte Street, Leith.

A report, giving details of the synthetic-resin process for reclaiming slightly porous castings, has recently been prepared by the Non-Ferrous Sub-Committee of the Technical Committee of the Institute of British Foundrymen. Copies are available on application to the above Institute, at St. John Street Chambers, Deansgate, Manchester 3.

Addressing the Royal Society of Arts, last week, Mr. Berry, chairman of the Metropolitan Water Board, revealed how the use of larger quantities of chlorine for purification purposes had enabled London to escape a typhoid epidemic during the heavy air-raid period, even though 3000 water mains had been smashed by enemy action.

The British-American patent interchange agreement, which was two years old on New Year's Day, has spurred the battle of production, according to a joint announcement by the U.S. Army and Navy. Under the arrangement, there has been a free flow of patent rights and scientific and technical information. Aircraft, radio, and ordnance particularly have benefited by this united effort.

The removal of black-out and anti-splinter obscuration screens from the windows of factories and workshops was favourably considered by the Scottish Fuel Efficiency Committee panel of engineers at a conference in Glasgow last week. It was estimated that thousands of tons of fuel could be saved in Scotland every week by the elimination of black-out devices for day shifts.

A considerable quantity of riboflavin has been found in beer by biochemists of the Cereals Research Station of the Ministry of Food and Professor R. H. Hopkins's brewing department at Birmingham University. In an article in last week's issue of *Nature*, Sir Jack Drummond and Dr. T. Moran quote figures for riboflavin content, and state that beer is a good source not only of riboflavin, but also of nicotinic acid.

Mr. Samuel Courtauld, chairman of Courtauld's, Ltd., said in Birmingham on Monday that the worker, who invests in industry all he usually possesses—his body, brain, and experience—was entitled by plain justice to some representation on the controlling body. Every worker, he continued, should be helped to take an intelligent interest in his industry and be made to feel that he had a real share in it, however subordinate his position. More public control on the higher levels would be permanently needed in future to guide, and when necessary restrain, powerful private business.

Mrs. D. A. Wallett, retiring chairman of the National Council of the Pottery Industry, in a review of the past year's work at Stoke-on-Trent, spoke of the special committee that was engaged, in conjunction with the Factory Department, in considering the regulations relating to pottery lead and dust. Research was proceeding to secure a non-siliceous body for earthenware, and the committee, being of the opinion that steps should be taken for the prohibition of the use of lead except in the form of low-solubility glazes, was making recommendations for after the war.

The chairman of the Midland Bank, Ltd., Mr. Stanley Christopherson, in his statement at the annual meeting, expressed the conviction that the economic progress of the country would depend very largely on the enterprise and resourcefulness of the small business undertaking and the individual business man. They were earnestly studying possibilities of so improving or widening their banking service as to furnish, for promising enterprises under good auspices, the fullest possible support, based as much upon the character, integrity, and business capacity of the borrower as upon the extent and nature of his material resources.

Foreign News

Total sales of Chilean nitrate for the year to June 30, 1943, were slightly lower, compared with the previous year, at 1,243,000 tons.

Bulgarian chemists have prepared a milk substitute from soya beans. Six to seven litres of ersatz milk are obtained from 2 lb. of beans. It is claimed that the product contains 5-10 per cent. fat.

The installation of X-ray diffraction equipment in the laboratories of the chemical engineering department of the Cooper Union, New York, started in December, 1942, has been proceeding throughout the past year, though slowly, owing to the difficulty of procuring materials. A proposed course for training women for positions in industrial laboratories had to be abandoned, on account of war conditions.

The Germans claim to have developed a new and better process for extracting oil from rape seed. The yield is said to amount to 38 per cent. of the rape, so that a normal crop of 20 double centners of rape per hectare produces nearly 1600 lb. of pure oil. A petrol-washing technique is used, the petrol being recovered afterwards by distillation. The product is a very mild edible oil which is either marketed in liquid form or hardened into a fat suitable for margarine preparation.

French chemical workers of the Chambéry chemical industries have been allowed to form a trade union, states Le Petit Dauphinois. This union would take in a large area, including the Savoie and Haute Savoie departments, and the Bellegarde canton. Regular trade unions were abolished after the fall of France, and it may be assumed that the new organisation is inspired by the Germans.

The establishment of a world-wide non-profit oil organisation, owning its own wells, refineries, and tanker fleet, was proposed recently by Mr. H. A. Cowden, president and general manager of the U.S. Consumers' Co-operative Association, of North Kansas City, Missouri, reports Reuter from Washington. He estimated the cost of the project at $12,000,000.

Mica is considered so vital to the United States war effort that it has been given a priority for shipment by plane next to that for critically needed personnel. The Axis adopted a similar policy from December, 1940, to June, 1941, when mica comprised 90 per cent. of the cargo carried by "Lati," the Italian air-line which formerly operated between South America and Europe.

Unprecedented competition between synthetic and natural textiles was forecast in a recent speech made by the executive director of the American Wool Council. War research, he commented, had brought about improvements in the synthetic products that would make them more formidable than ever as substitutes for wool. Without intelligent experimentation and promotion on the part of their producers, wool and mohair would become merely blending fibres of secondary importance.

The American chemical industry spends more money per worker on safety equipment than any other industry. This fact emerges from a War Production Board survey. The average *per capita* expenditure on safety equipment for all the different industries included in the survey was $3.8. The figure for chemical factories was $6, as against $5.75 and $5.22 in merchant shipping and aircraft manufacture, the next two trades on the list. In the food and leather trades, for instance, the figures were only $1.75 and $0.61 respectively.

Forthcoming Events

The Electrodepositors' Technical Society is meeting at the Northampton Polytechnic, Clerkenwell, E.C.1, at 5.30 p.m. on **January 31**, to hear a lecture by Mr. H. A. Holden, B.Sc., A.R.C.S., on "Chemical and Electrochemical Factors Influencing the Formation of Phosphate Coatings." This will be followed by a paper on "The History and Development of Phosphate Coatings," presented by R. C. Davies and S. J. Scouse.

A meeting of the **Electrodepositors' Technical Society,** Birmingham section, will be held at the James Watt Memorial Institute, at 5 p.m., on **February 1,** when a discussion will be held on "Plating Plant."

A meeting of the **Institute of Fuel** will be held in the lecture theatre of the Institution of Electrical Engineers, Savoy Place, London, W.C.2, on **February 1,** at 2.30 p.m., when a paper on "Liquid Fuels and Organic Chemicals from Coal and Home-Refined Petroleum" will be given by Mr. Harold Moore, M.Sc., F.Inst.Pet.

Mr. E. C. Goldsworthy, Development Officer of High Duty Alloys, Ltd., will lecture the **Royal Society of Arts** on "Light Alloys in Post-War Britain" on **February 2.** The meeting will take place at the Society's premises in the Adelphi, London, W.C.2, at 1.45 p.m.

A series of lectures on "The Strategy and Tactics of Crystal Structure Analysis by X-rays" is being given by Sir Lawrence Bragg at the **Royal Institution.** Lectures have been arranged for **February 3, 10** and **17,** at 2.30 p.m.

At the meeting on **February 4** of the **Royal Institute of Chemistry,** Huddersfield section, a number of scientific films will be shown, including the two I.C.I. pictures, "This is Colour" and "The Discovery of a Pigment," which deals with the discovery and production of Monastral Blue.

At a joint meeting of the **Society of Chemical Industry** and the **Institute of Petroleum** to be held in Manchester at the Grand Hotel, Aytoun Street, at 2.30 p.m., on **February 4,** Dr. F. Kind will deliver an address on "Petroleum Refining—A Chemical Industry."

The **Society of Chemical Industry,** Glasgow section, is holding a joint meeting with the **Chemical Society** and **Royal Institute of Chemistry** on **February 4,** at 7.15 p.m., at the Royal Technical College, Glasgow, when a lecture entitled "Some Aspects of Toxic Hazards in Industry" will be given by Dr. Goldblatt.

Company News

Genatosan, Ltd., are paying an interim dividend of 10 per cent. (same).

English Clays, Lovering Pochin & Co., Ltd., announce a profit of £79,493 (£74,799) for the year ended September 30, and are paying a dividend of 2 per cent. (same).

Redfern's Rubber Works, Ltd., are paying final dividends of 3¾ per cent. on the A and B preference shares, making 7½ per cent. (same), and 6¼ per cent. on the ordinary shares, making 10 per cent., plus a bonus of 2 per cent. (same). Net profit after tax provision amounts to £19,334 (£14,121).

English China Clays, Ltd., announce that the dividend on the 7 per cent. preference shares for the half-year to December 31 last, is payable on February 3.

The directors of **Benn Brothers Limited** have declared the following dividends, less tax, payable on February 15: 3 per cent. on the preference shares for the half-year ended December 31, and an interim dividend of 5 per cent. on the ordinary shares (same).

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

BRITISH ALUMINIUM CO., LTD., London, E.C. (M., 29/1/44.)—January 3, dispositions by P. B. Nicholson (as trading) and Mrs. E. M. Imrie, with consent of the company, granted in implement of a trust deed dated September 12, 1934; charged on Lyndhurst, 4 Abbots Road, Grangemouth, and Shirrim, 81 Larbert Road, Bonnybridge, respectively. *£3,312,318. April 13, 1943.

Company Winding-up Voluntarily

RADIUM PREPARATIONS, LTD. (C.W.U.V., 29/1/44.)—January 10 (members). A. L. Benzing, liquidator.

New Companies Registered

Textile Auxiliaries, Ltd. (384,601).—Private company. Capital: £5000 in 5000 shares of £1 each. Merchants, importers, exporters, manufacturers of and agents for chemicals, chemists' sundries, oils, organic and inorganic products, etc. Subscribers: H. W. Fisher; Margaret E. Crichton. Registered office: 1 Booth Street, Manchester.

Petal Products, Ltd. (384,595).—private company. Capital: £1000 in 1000 shares of £1 each. Manufacturers of and dealers in chemicals, medicines, drugs, oils, colours, electrical, surgical and laboratory equipment, etc. Directors: Mrs. Anne Feigl; F. S. Feigl; Marion H. S. Dannah. Registered office: Old Town Hall Chambers, 41 Guildhall Lane, Leicester.

Koppers Coke Oven Company (1943), Ltd. (384,589).—Private company. Capital: £100 in 100 shares of £1 each. Manufacturers and builders of retorts, furnaces, coke ovens, plant and apparatus for the distillation, fractionation, depositing or treatment of solid, liquid or gaseous matter, etc. Directors: F. B. Richards; G. J. Jackson; D. Rider. Registered office: "Uplands," Epsom Road, Guildford, Surrey.

Chemical and Allied Stocks and Shares

IN most sections of the Stock Exchange steady but inactive conditions have again prevailed. Sentiment was aided by the trend of the war news, and the absence of selling indicated confidence in the future. British funds had a less active appearance.

Compared with a week ago, most movements in shares of companies connected with the chemical and kindred industries have not exceeded more than a few pence. Imperial Chemical at 38s. 3d. were unchanged on balance. Borax Consolidated deferred at 37s. 6d. were also the same as a week ago; the dividend announcement is expected next month. Lever & Unilever showed further improvement from 36s. to 36s. 6d.; here sentiment was governed mainly by hopes of recovery in dividend payments after the war. Triplex Glass 10s. ordinary, at 38s. 1½d., were somewhat lower than a week ago. Turner & Newall, which remained under the influence of the financial results and the chairman's annual statement, strengthened to 78s. 3d. United Molasses were 6d. better at 32s. 6d., and British Aluminium improved by a similar amount to 48s. At 80s. 6d. British Oxygen were unchanged on balance. Nairn & Greenwich at 70s. regained part of an earlier reaction. Barry & Staines moved back 9d. to 44s. 3d. Imperial Smelting kept their recent improvement to 13s. 6d.

B. Laporte were quoted at 75s. British Drug Houses were 23s., Monsanto Chemicals 5½ per cent. preference again 23s. 6d., and Greeff-Chemicals 5s. ordinary were 7s. 3d. Cellon 5s. ordinary were 23s., while Blythe Colour 4s. ordinary were around 9s. International Paint showed firmness at 110s.; the dividend announcement is due in a few weeks. Wall Paper deferred units eased from 39s. 3d. to 38s. 6d. W. J. Bush ordinary kept at 60s. At 64s. 6d. Associated Cement continued to hold their recent improvement, as did British Plaster Board at 29s. There were again a number of gains among iron and steel shares, some of which have been favoured in view of the apparently attractive yields. Tube Investments have risen further from 94s. to 95s. 9d. at the time of writing. Stewarts & Lloyds deferred strengthened to 54s., while Dorman Long were 29s., Guest Keen 33s. 7½d., and United Steel 24s. 7½d. Elsewhere, Babcock & Wilcox eased to 49s. 9d. Allied Ironfounders were again 49s. 3d., and Amalgamated Metal shares 17s. 9d.

Among plastics, De La Rue at 158s. 9d.

were unchanged on balance. British Industrial Plastics 2s. ordinary were 6s. 9d., and Erinoid 5s. ordinary again 10s. 6d., while Lacrinoid Products were 4s. 6d.; the dividend announcement of the last-named company is due next month. Elsewhere, Fisons ordinary were 47s. 6d.; here, again, the dividend is due shortly; in respect of the previous financial period it was at the rate of 10 per cent. per annum.

There was a better tendency in rayon shares. British Celanese were 27s. 9d., compared with 27s. 3d. a week ago, and Courtaulds 53s., compared with 52s. 6d. Results of the last-named company can be expected in March; in respect of the previous year the dividend was 7½ per cent., on which basis the yield at the current price is very small. The price, however, reflects general recognition of the strong balance-sheet position and the belief that after the war there may be good scope for recovery in earnings and dividends. Among other textiles, Bradford Dyers eased from 22s. to 21s. 9d., and Bleachers ordinary were maintained at 10s. 6d.

In other directions, Boots Drug were maintained at 42s., while Sangers were 23s. 7½d., and Timothy Whites 33s. 1½d. Although best prices were not held, there were various gains on balance in oil shares. Burmah Oil were good, for example, having risen to 80s. 7½d., compared with 77s. 6d. a week ago.

REDUCING OUTPUT OF EXPLOSIVES

Indicative of the enormous reserves of war munitions accumulated by the United Nations is the fact that output of certain products is being substantially reduced. A typical instance comes from Canada, where the explosive plants of Defence Industries, Ltd., at Nobel, Ontario, are being gradually closed and the employees laid off. The Canadian correspondent of THE CHEMICAL AGE, writing in December, states: The Nobel plants now employ 2000 workers. Beginning January 1, they will be laid off over a period of 8-10 weeks or possibly longer, after which the plants will be closed. The lay-off and shut-down are necessitated by the fact that considerable stocks of explosives have been built up. Great Britain and the United States have recently reduced their output of these products and the action at Nobel is in line with the general production of United Nations, explained a spokesman of the Canadian Department of Munitions and Supply. Defence Industries, Ltd., has sent most of its products to Great Britain.

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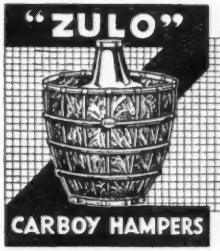

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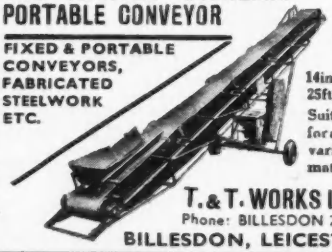

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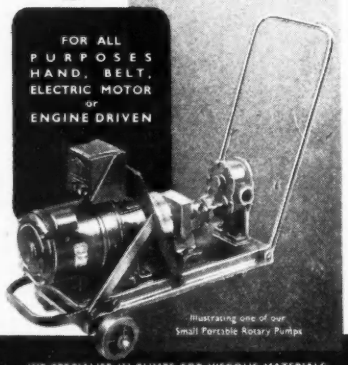

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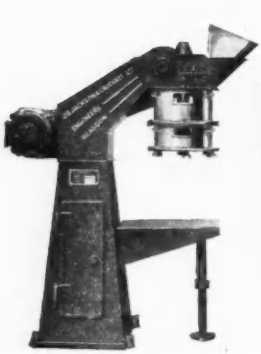

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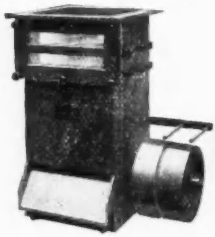

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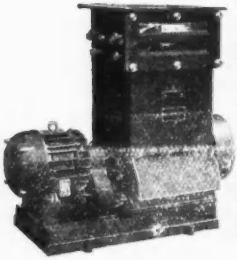

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